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ABSTRACT

Produced for a faculty development colloquium at the City University of New York (CUNY), this annotated bibliography includes abstracts of a total of 108 papers and monographs in the following areas: (1) theoretical background on visual and information literacy; (2) research on merging technologies and instruction; (3) library applications of technology, including online catalogs, CD-ROM, the Internet, Hypertext, and virtual reality; and (4) multimedia programs. A copy of the program for the colloquium, which represented an alliance of CUNY computing, media, and information professionals, is included. An author index, a glossary of multimedia terminology, and a directory of authoring systems are also provided. (MES)

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MERGING TECHNOLOGIES AND INSTRUCTION AT CUNY

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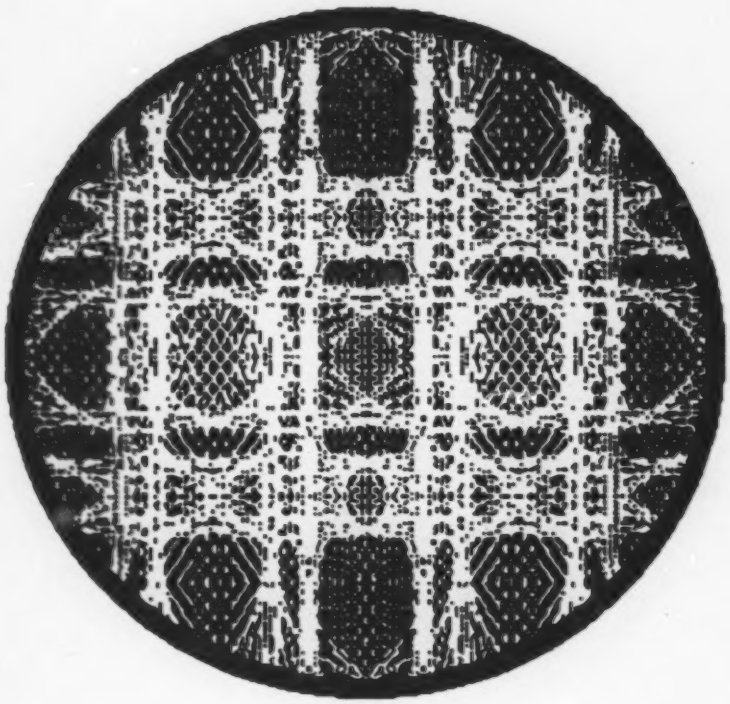

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INTRODUCTION

The program topic, *Merging Technologies and Instruction at CUNY*, represents a unique alliance of computing, media and information professionals across the university. New opportunities exist for educators to create programs and provide ways of accessing information that use traditional methods in combination with the innovative techniques afforded by the proliferating, diverse and sophisticated technologies now available. Several papers in this bibliography point up the need for new approaches to information provision.

Patricia Ann Carlson in her article, "Square Books and Round Books" (cited on page 18 herein) stresses the fact that "we are in the midst of a potentially dangerous split between those who participate in traditional literacy and those who either cannot or will not." She maintains that present traditional methodology for teaching the cognitive skills needed for life in our complex society is "failing a significant portion of the populace." More and more of our youth (the television generation) belong to a "non-literate group," and it behooves us as educators (teachers, librarians, media specialists) to work together to find ways to move them into the literate tradition. Even the literate members of our society who approach the acquisition of information too narrowly can benefit from new techniques that broaden their path to knowledge.

Hugh Osborn's paper, "Media, Computers, Motivation and Informal Education: Gutenberg 2000," (pages 357-381 in Ambron, 1990 cited on page 24 herein) points out that "As we approach the year 2000, we are awash with information yet unable to learn effectively." He suggests that if we are to thrive as a nation and as individuals, we must develop a thirst for knowledge--the motivation to learn. Osborn contends that the new technologies "can help create this motivation and foster learning in our homes and schools, in our children and in ourselves."

The program and the bibliography highlight these issues and address various ways that the new technologies can be used most effectively in the areas of teaching, learning and research.

Abstracts have been derived from those appearing in printed or online citations when they have been deemed appropriate to this publication.

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MERGING TECHNOLOGY AND INSTRUCTION AT CUNY
A UNIVERSITY FACULTY DEVELOPMENT PROGRAM COLLOQUIUM

DATE: *Friday, May 1, 1992*

LOCATION: *John Jay College of Criminal Justice, Theatre*
899 Tenth Avenue

TIME: *9:00 A.M. - 4:30 P.M.*

9:00- 9:30 *Registration & Coffee*

9:30-10:00 *Greetings*
Colette Wagner, Joint Planning Committee
CECT/CUNY Video Presentation
Innovations in Computing & Media in CUNY

10:00-10:45 *Building a Foundation: Technology in Perspective*
Robert Diamond, Syracuse University

10:45-11:45 *Technology in the Classroom: The CUNY Creative Team*
John Haney, Queens College
Che Huang, York College
Lisa Livingston, City College
Mary Rothlein, Dean for Planning, John Jay College of Criminal Justice
Louise Spain, Laguardia Community College

11:45- 1:00 *Lunch*

1:00- 1:45 *Thinking Visually*
Catherine Egan, Avery Fisher Center for Music and Media, NYU

2:00- 3:00 *Concurrent Sessions*

Bibliographic Instruction in Hypertext: the CUNY+ Simulator
Jeanne Galvin and Michael Rosson, Kingsborough Community College

Defining the MEDIA in Multimedia
Lisa Livingston, City College
Ken Spelke, Queens College
David Turkiew, New York City Technical College

New Information Storage & Retrieval Formats: CD-ROM Technology
Mario Charles, Baruch College

3:00- 4:00 *Multimedia Tools for Teaching: CUNY Works in Progress*

IN THE LIBRARY...GETTING STARTED Joan Baum & Elayne Feldstein (York)
THE FIVE POINTS Anthony Picciano & Stephen Brier (Hunter)
THE PILGRIMAGE EXPERIENCE Paula Berggren & David Stephan (Baruch)
THE HARLEM EXPERIENCE Michael Fitzgerald (Medgar Evers) & Bruce Naples (Queensborough)

4:00- 4:30 *Reception*

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VISUAL LITERACY/INFORMATION LITERACY: THEORETICAL BACKGROUND

Anglin, Gary J. "Effect of Pictures on Recall of Written Prose: How Durable Are Picture Effects?" *ECTJ: Educational Communication and Technology*, 35 (Spring, 1987), 25-30.

There is now substantial evidence that pictures can be used to facilitate the recall of information presented in prose passages. There is also evidence that the presence of pictures in prose passages does not hinder the recall of information that is not pictured.

Arnheim, Rudolf. *Art and Visual Perception: A Psychology of the Creative Eye*. (Berkeley, CA: University of California Press, 1954. 408 p.

In his book on artistic creation, Arnheim systematically applies to the understanding of art the results of scientific inquiry into the process of seeing, particularly as formulated by the gestalt psychologists who hold that we know reality by creatively projecting meaning into whole configurations of details, rather than by mechanically recording visual details that are later put together by reason. It would be equally correct to state this the other way around, for such is the dual nature of the book, and say that Professor Arnheim's is a systematic attempt to illustrate the process of seeing by means of art. This book bridges the gap between art and science as methods of understanding man and his world. [Summary of review by Ernest Mundt in *San Francisco Chronicle* from *Book Review Digest* 1954, p. 24

Breivik, Patricia Senn, and E. Gordon Gee. *Information Literacy: Revolution in the Library*. (New York: American Council on Education, 1989).

Top-level academic administrators must look beyond the traditional role of libraries in colleges and universities and consider how library personnel and resources can be used to advance campus priorities. The concept of information literacy serves as the basis of their vision of an extended role for libraries and librarians in helping to transform education into "active and integrated learning" that produces the "self-directed lifelong learner." Lifelong learning is possible only for those who are information literate, and it is the library and librarians that are uniquely qualified to play a role in that process. [Melissa D. Trevett, *College & Research LIbraries*, 51 (January, 1990), 77-78]

Davies, Duncan, Diana Bathurst, and Robin Bathurst. *The Telling Image: Changing Balance Between Pictures and Words in a Technological Age*. (New York: Oxford University Press, 1990). 166 p.

Electronic technologies, unknown thirty years ago, have continued the emphasis on universal literacy begun with the invention of the printing press. However, they have done more than bring alphanumerics to preeminence over images. Electronics have made possible technologies that may make pictures as important to human communication as they were more than 3000 years ago. The authors describe video conferencing, interactive video, high-definition television, facsimile machines, satellite surveys as new or innovative communication technologies that need not rely on written or numerical analysis. But new or innovative images are a problem for people who rely on alphanumerics. Schools are among the few places with a grasp of what it means to integrate pictures, words, and numbers. Therefore, the onus is on teachers to find the balance among the three.

Dondis, Donis A. *A Primer of Visual Literacy*. (Cambridge, MA: MIT Press, 1973). 194 p.

This book is a survey of the elements of design and the making of visual works--art, crafts, etc. It is designed to teach students the interconnected arts of visual communication. The subject is presented, "not as a foreign language, but as a native one that the student 'knows' but cannot yet 'read.'" Illustrative examples are included to clarify the basic elements of design to show how they are used in simple syntactical combinations and finally present the meaningful synthesis of visual information that is a finished work of art. [Publisher's Note]

Information Literacy and Education for the 21st Century: Toward an Agenda for Action: A Symposium. Sponsored by the U. S. National Commission on Libraries and Information Science and the American Association of School Librarians, 14-16 April, 1989, Leesburg, Virginia. (Washington, DC: The Commission, 1991). 103 p. Eric Document No. ED 330 343.

Published in book form as *Information Literacy: Learning How to Learn*. See annotation on page 6, Jana Vareljs, Editor.

Jones, Karen Sparck. "The Role of Artificial Intelligence in Information Retrieval." *Journal of the American Society for Information Science*, 42 (September, 1991), 558-565.

Presenting a view of the scope for artificial intelligence in information retrieval, this article considers four potential roles for AI in IR. Jones evaluates AI from a realistic point of view and within a wide information management context. She concludes that AI has limited potential, not just because it is itself insufficiently developed, but because many information management tasks are properly shallow information processing ones. There is nevertheless an important place for specific applications of AI or AI-derived technology when particular constraints can be placed on the information management tasks involved.

McLuhan, Marshall, and Eric McLuhan. *Laws of Media: The New Science*. (Toronto: University of Toronto Press, 1988). 258 p.

This book, consisting of several of McLuhan's unfinished chapters and manuscripts revised and extended by his son, presents his four laws of media: The Law of Enhancement (What does the medium enhance or intensify?), The Law of Obsolescence (What does the medium render obsolete, or what does it replace?), The Law of Retrieval (What does the medium retrieve that was previously obsolete?), and The Law of Reversal (What does it produce or become when pressed to its extreme?) The McLuhans present a visual analysis applying the laws to various media. They argue for their alternative analysis of the impact of technology which will enable control of this technology and our environment.

Nix, Don, and Rand Spiro. *Cognition, Education, and Multimedia: Exploring Ideas in High Technology*. (Hillsdale, NJ: L. Erlbaum, 1990. 214 p.

This volume includes the following essays on the subject expressed in the title: "Contextual Enrichment by Videodisc", by Patricia M. Gildea, George A. Miller, and Cheryl L. Wurtenberg; "Books on Videodisc: Computers, Video, and Reading Aloud to Children," by Carol Chomsky; "Computers and Videodisc Technology for Bilingual ASL/English Instruction of Deaf Children," by Vicki L. Hanson and Carol A. Padden; "Literacy as Search: Explorations Via Computer," by John T. Guthrie and Mariam Jean Dreher; "Anchored Instruction: Why We Need It and How Technology Can Help," by John D. Bransford, *et al.*; "Should Computers Know What You Can Do With Them?" by Don Nix; "Cognitive Flexibility and Hypertext: Theory and Technology for the Nonlinear and Multidimensional Traversal of Complex Subject Matter," by Rand J. Spiro and Jihn-Chang Jehng.

Olson, David R. *Media and Symbols: The Forms of Expression, Communication, and Education*. (Chicago, IL: University of Chicago Press, 1974). 508 p. [73rd Yearbook of the National Society for the Study of Education]

In 1954, the *NSSE Yearbook* examined television as the newest mass medium that could no longer be ignored as an educational force. Its potential for both good and evil was the subject of inquiry. Twenty years later, the *NSSE Yearbook* zeroes in on both the instructional potential and limitations of new technologies of communication, identifying limitations both in the failure of educators to exploit the potential and in the deliberate restrictions educators, threatened by the changes new technology sets in motion, have placed on usage. Olson examines the possibility that the communications revolution necessitates a broadening of the educational process. The question posed by George Gerbner at the end of the book is whether communications revolutions lead to fundamental change or only extend the reach and scope of present structures. "The answer resides not in the potential of technology, but in the response of institutions." And institutions use technology to further their own purposes.

Palmer, Janet J. *Cultural Literacy and Computer Literacy: Cautions for the Third World*. 1990. 11 p. ERIC Document No. ED 331 496.

To prepare students for the Information Age, many developing nations provide courses in computer literacy. While computers can teach more efficiently and effectively than traditional methodologies, developing nations need to be aware of the effect of computer literacy on cultural awareness and cultural literacy. Computers, as language-based devices, can select, amplify, reduce, and even eliminate, elements of a society's culture, because they themselves are influenced by culture. Solutions to this computer-cultural literacy problem include reassessing the role of the teacher in an electronic classroom, examining the rationale behind the use of computer-assisted instruction, and using multicultural versions of computer software and hypermedia.

Purves, Alan C. *The Scribal Society: An Essay on Literacy and Schooling in the Information Age*. (New York: Longman, 1990). 118 p.

The emergence of two cultures, the scribal culture and the popular culture, creates contradictions. There is a proliferation of information rooted in print (scribal) and a disjunction between scribalism and the good life of materialism. Although the scribes control information and its flow, there is a sense of powerlessness among the moderately literate in the mass culture. Mass culture, now electronic, makes it possible to be rich without being a scribe. Purves offers a view of literacy and education that aims to solve the problem of disaffection for texts among today's students. He argues that print is permanently here and that "it remains important to be literate."

Salomon, Gavriel. *Interaction of Media, Cognition, and Learning: An Explanation of How Symbolic Forms Cultivate Mental Skills and Affect Knowledge Acquisition.* (San Francisco: Jossey Bass Publishers, 1979). 282 p.

This theoretical approach to media research proposes that differences in learning that occur between two or more media are due to the different "attributes" of media, different learning tasks and learning abilities. The most important attributes of media are their symbol systems and the ways that these systems code or shape instructional information. Examples of symbol systems are verbal language, cartography, mathematics, painting, and music. Salomon claims that "other things being equal, nonnotational systems, when perceived as depicting lifelike messages, allow shallower processing than notational symbol systems." Highly verbal systems (books) demand more effort to decode than less notational systems such as television or photography and may be expected to lead to more effective instruction. Children watching television will not exercise the more demanding cognitive skills required of the reader, those skills acquired by experience with nonnotational systems may not be as valuable in promoting desirable learning, and may be acquired at the expense of the exercise of more important verbal and mathematical skills.

Sinatra, Richard. *Visual Literacy Connections to Thinking, Reading, and Writing.* (Springfield, IL: C. C. Thomas, 1986). 307 p.

Visual literacy is defined by the author as "the active reconstruction of past visual experience with incoming visual messages to obtain meaning." He attempts to show that visual literacy is a link to better composing and comprehending. The first section of the book lays the foundation and makes connections between visual literacy and the ensuing literacies; in the second section, Sinatra relates visual literacy to brain processing, making a comparison of verbal and nonverbal literacies and reviewing the learning-style view of visual literacy; and in the last section he provides strategies to improve and embed visual literacy within the processes of writing and understanding. The book contains many strategies based on examples from actual classrooms.

Tufte, Edward R. *Envisioning Information.* (Cheshire CT: Graphics Press, 1990). 126 p.

Tufte expands on the ideas expressed in his first book (cited below) This volume is about ways of representing complex and multidimensional information of any kind--"how to communicate information through the simultaneous presentation of words, numbers, and pictures." He discusses what makes for good or bad visual displays of information. He attempts to change the traditional view that discourse is primary and graphics are simply illustration, toward the view that discourse is often problematic and that methods for the graphic display of information are for many purposes superior in the portrayal of density, complexity, and dimensionality.

Tufte, Edward R. *The Visual Display of Quantitative Information.* (Cheshire, CT: Graphics Press, 1983). 197 p.

In his first book about "the use of abstract, non-representational pictures to show numbers", Tufte deals with statistical graphics, charts, maps, and tables, setting forth principles for design and criticism, and applying these principles to a variety of good and bad historical examples illustrated with new designs.

Van Houweling, Douglas E. "Information Technology: A Survey from the Perspective of Higher Education." *Library Hi Tech*, 4 (Winter, 1986), 23-31.

The author examines the current and near-term realities related to computing hardware, communication technology, storage technology, software, and the human-computer interface. He addresses the implications of present and future interactions between information and technology.

Van Houweling, Douglas E. "The Information Network: Its Structure and Role in Higher Education." *Library Hi Tech*, 5 (Summer, 1987), 7-17.

The author examines the impact of the changes in hardware and software technology and economics on the design, or "architecture" of information technology facilities in higher education. After summarizing the historical trends towards distribution of computing power, he outlines a novel architectural approach to information technology in higher education, which stresses a comprehensive network, collaborative time-sharing with common information storage and exchange. He addresses geographic coverage, adaptability and expandability, standards, distributed control, local area subnetworks, workstation based computing, server facilities, and the interfaces needed for this integrated software environment.

Vareljs, Jana, Editor. *Information Literacy: Learning How to Learn.* (Jefferson, NC: McFarland & Co., 1991). 86 p.

Based on the proceedings of an invitational symposium convened for the purpose of producing a coalition of educators committed to incorporating the concept of information literacy into the K-12 curriculum as well as into teacher preparation programs, this collection of papers moves beyond defining the concept of information literacy to address the ramifications of achieving its goals. The volume includes papers by Patricia Glass Schuman, Carol Kuhlthau, Karen Quinn, Prudence Dalrymple and Charles Curran, and Major Owens. Representative Owens advises information professionals to take the initiative in substantive information literacy planning to prevent new education funding from being usurped by the construction industry for unneeded buildings and inappropriate equipment. [Also available as cited on page 2: *Information Literacy and Education for the 21st Century....* ERIC Document No. 330 343]

Albright, M. J. "It's Time to Rethink Instructional Services in Higher Education." *TechTrends*, 34 (October, 1989), 40-45.

This discussion of the role of instructional technology in higher education highlights a model for Integrated Instructional Technology Services (IITS). Topics discussed include instructional development, faculty development, learning resources, media development, instructional telecommunications, instructional computing, research and evaluation, and the relationship of the library and computer center to the IITS model.

Anandam, Kamala, Editor. *Transforming Teaching with Technology: Perspectives from Two-Year Colleges*. [EDUCOM Strategies Series on Information Technology] (Boston, MA: Interuniversity Communications Council, 1989). 432 p.

Focusing on the diversity of the uses of technology in education and the institutions which apply them, this book presents 13 articles describing technological transformations in teaching at two-year colleges throughout the United States. Articles cover Academic Computing, Instructional Technology, High Tech Centers, and Cooperative Programs.

Anderson, Charles. "Digital Video: How It Works, What It Can, and Cannot Do, -and When It's Coming." *Instructional Innovator*, 27 (March, 1982), 22-27.

The author discusses the advantages and disadvantages of digital television signals as opposed to analog signals and considers how "going digital" might affect existing analog instructional television systems. He examines the costs, quality, and flexibility of using digital television signals.

Balkovich, E., S. Lerman, and R. P. Parmelee. "Computing in Higher Education: The Athena Experience." *Computer*, 18 (November, 1985), 112-128.

The authors discuss the use of computation in higher education by speculating on how computer technology might be of actual use in the curriculum, and by seeking to identify areas where current educational methods have observable deficiencies that might be alleviated by computers. They present a model of computation that could sustain pedagogical paradigms concerning the use of computation and discuss the wide scale implication of this model for university life. They describe the computer as a simulator of complex systems, a laboratory instrument, a virtual laboratory, a textbook, a blackboard, a special-purpose learning environment, a communications medium, and as a mediator.

Bates, A. W. "Some Unique Characteristics of Television and Some Implications for Teaching and Learning." *Journal of Educational Television and Other Media*, 7 (Winter, 1981), 79-86.

Television has unique educational characteristics that separate it from other media. These characteristics have implications for teaching and learning. This discussion of distributional and social control, and symbolic (audiovisual) characteristics is based on published surveys and on research carried out at the Open University in Great Britain.

Bossone, Richard M., and Irwin H. Polishook, Editors. *New Frontiers in Educational Technology: Trends and Issues.* Proceedings of the Conference of the University/Urban Schools National Task Force. (8th, San Francisco, CA, November 14-15, 1986). 90 p. ERIC Document No. 281 524.

The papers in this collection of presentations at a conference of the University/Urban Schools National Task Force address topics on trends in educational technology and issues in teaching with educational technology. The following papers are included: "The Appropriate Use of Technology in Education," by James E. Dezell, Jr.; "AT&T and the Future of Educational Technology," by James P. Burke; "The School of the Future," by Judith Johns Hubner; "The Past as Invitation: The Video Encyclopedia of the 20th Century," by Roger B. Fransecky; "Information Retrieval and the Computer," by Ronald J. Boehm; "Technology and the Student's Education," by John Vasconcellos; "American Federation of Teachers' Perspective," by David H. Florio; "National School Boards' Perspective," by James A. Mecklenburger; "A Professor's Perspective," by Alfred Bork; "A Publisher's Perspective," by Richard Robinson; and "Educational Technology in California," by Bill Honig.

Brinkley, R., and Others. "Designing and Producing Courseware for Distance Learning Instruction in Higher Education." *TechTrends*, 36 (1991), 50-54.

The authors describe a nine step method for the design and production of instructional television courses used for distance learning instruction in higher education. The method calls for a team approach including the faculty member, instructional designer, and a design/production team. The design and production involves the construction of a course map.

Brockenbrough, S. Allen, Bernard J. Dodge, and Farhad Saba. "An Educational Technology Curriculum for Converging Technologies." *Educational Technology Research and Development*, 37, No. 4 (1989), 47-54.

This article reviews issues relating to converging technologies and describes how they are affecting the Educational Technology curriculum at San Diego State University. In the 1990s, digital encoding will cause different modalities for presenting information to converge. These convergent technologies will require a new kind of educational designer and a realignment of graduate programs. Curriculum revision efforts should address commonalities inherent in convergent technologies and should incorporate emerging design tools, procedures and principles.

Brockenbrough, S. Allen. *Electronic Text: An Amalgam of Capabilities for Creating, Informing, and Instructing (Higher Education)*. (San Deigo, CA: San Diego State University, 1985). 47 p. ERIC Document No. ED 265 829.

This paper argues that electronic text applications in higher education can be conceptualized in terms of three communicational intentions of computer-based systems: informational, instructional, and instrumental (tool-oriented). The author contrasts product-oriented and service-oriented applications of electronic texts and explores instructional applications through case histories of mature computer-based instructional systems including TICCIT and PLATO.

Burns, Ralph A. "The Two-Year College: Designing Presentations to Help Students Remember." *Journal of College Science Teaching*, 19 (March-April, 1990), 301-305.

The studies presented confirm the idea that factors related to the format, the order of items presented, and the presentation style can affect the impact of information and student recall. Burns discusses the dynamic presentations, enumerated items, impact and timing, pairing of items, data summaries, and information load.

Cerych, Ladislav. "Impacts of New Information Technologies on Higher Education." *Higher Education*, 10 (October-December, 1985), 6-12.

The challenge of new information technologies goes beyond university training of information specialists and information science research to include training for all professions facing the use of such technology, development of educational technology, and its use in teacher education, and research on the relationship of technologies and social behavior.

Clark, Richard E., Editor. "Instructional Media and Technology Research." *International Journal of Educational Research*, 14 (1990), 485-579.

Seven papers present current research approaches from several countries about the use of media in education. Topics include European research on media/technology in education, North American research on learning from media, controlled versus classroom research on computers, textbook design, critical television-viewing curricula, research on learning from graphics, and self-study packages.

Clark, Richard E., and Gavriel Salomon. "Media in Teaching." In *Handbook of Research on Teaching*. Edited by Merlin C. Wittrock. 3rd Edition. (New York: Macmillan, 1986), 464-476.

This review of the literature on media in teaching distinguishes the research in this field from "instructional technology" emphasizing that this article is concerned with the study of media when it serves instructional functions ("media *in* teaching") omitting those studies concerned with "the technology *of* instruction." The authors discuss reviews and meta-analysis of media studies, cognitive aspects of media attributes, several symbol system theories and approaches to the study of media, the implications of these approaches, and offer suggestions for future research.

Clark, Richard E., and Brenda M. Sugrue. "North American Disputes About Research on Learning from Media." *International Journal of Educational Research*, 14 (1990), 507-520.

In North America, some of the more important media disputes focus on (1) the effects of different media on learning; (2) whether media play an essential role in the cultivation of or transfer of cognitive skills; (3) the motivating properties of media, and (4) the economic benefits of different media. This review suggests that American media researchers tend to belong to either a "strong" or a "weak" media theory group. After an examination of the two extreme theory positions, the authors conclude that sufficient evidence has not been advanced to support a "strong" theory of media effects on learning, motivation, or cost.

Clark, Richard E. "Reconsidering Research on Learning from Media." *Review of Educational Research*, 53 (Winter, 1983), 445-459.

Clark reviews recent meta-analyses and other studies of media's influence on learning. He finds consistent evidence for the generalization that there are no learning benefits to be gained from employing any specific medium to deliver instruction. He cites research indicating that performance or time-saving gains from one or another medium are vulnerable to rival hypotheses concerning the uncontrolled effects of instructional method and novelty. Citing some problems with current media and symbol system theories, he suggests other research directions.

Diamond, Robert M. *Designing and Improving Courses and Curricula in Higher Education: A Systematic Approach.* (San Francisco: Jossey- Bass, 1989).

The following chapters in this study present a systematic approach to the improvement of courses, programs and curricula in higher education: (1) Benefits of a Systematic Approach to Course and Curriculum Improvement; (2) Making the Decision to Create or Redesign a Course or Program; (3) Selecting a Design Team and Establishing Goals and Procedures; (4) Gathering and Analyzing Essential Data; (5) Developing a Design for the Ideal Course or Program; (6) Adjusting the Ideal to the Real; (7) Clarifying Instructional Objectives and Assessing Outcomes; (8) Selecting and Developing Instructional Media; (9) Preparing a Descriptive Manual for Students; (1) Implementing, Evaluating and Refining the Course or Program; (11) Facilitating Curriculum Improvement through a Central Campus Agency; and (12) Ensuring the Success of Instructional Improvement Programs.

Fleit, L. H. "Computerizing America's Campuses: How Technology Is Changing Higher Education." *Electronic Learning*, 6 (March, 1987), 18-23.

This discussion of the increasing use of computers in colleges and universities focuses on changes that are occurring as a result of such use. Highlights include library automation, the effects of microcomputers, the growth of networks, changes in software, budget considerations, administrative staffing patterns, and outlooks for the future.

McMurdo, G. "Talking with *JIMMY*: Using Electronic Publications in Higher Education." *Online Review*, 14 (April, 1990), 77-94.

Electronic publishing and computer-mediated communication systems are powerful educational tools. The author describes the advantages of using this technology, emphasizing the importance of user friendliness to the success of an information system.

Niemeyer, Daniel, and Barbara A. Black. "Deliver Media Services...Not Hardware." *TechTrends*, 34 (November-December, 1989), 34-39.

The authors discuss ways to provide media support in college classrooms, highlighting the design of media-equipped classrooms. They discuss choice of classrooms, classroom design, support staff, communicating to encourage media use, and specifications for equipment in the media-equipped classrooms at the University of Colorado at Boulder.

Ostini, M. F. "The Application of New Information and Communication Technologies in Higher Education Teaching: A Perspective." *Higher Education in Europe*, 10 (October-December, 1985), 20-27.

This survey of nine Western European countries concerns use of the new information technologies in higher education, examines the status of educational technology in Swiss universities, and discusses issues arising in the widespread adoption of educational technology in higher education.

Peterson, Betty L. *A Comparison Between Achievement Gains in Multimedia Instruction and Conventional Lecture Method of Instruction of Nursing Courses at Northern Virginia Community College*. (Annandale, VA: Northern Virginia Community College, 1974). 42 P. ERIC Document No. Ed 129 282.

An evaluation was conducted at Northern Virginia Community College to assess the effectiveness of courses in nursing education presented in two distinctly different styles: the traditional lecture method; and a multimedia approach employing textbooks, audiovisual aids, study guides, and lectures. Using state board of nursing examination scores as a measure of instructional outcomes, comparisons were made which demonstrated that students were equally likely to master nursing skills regardless of the mode of instruction. This report provides background information on the study, outlines the research methodolgy, reviews relevant literature, analyzes data, and summarizes results.

Pultorak, Ed, and Others. *Teacher Education: Closing the Gap Between University and Extension Programs*. Paper Presented at the Annual Meeting of the Association of Teacher Educators. (Las Vegas, NV: February 5-8, 1990). 15 p. ERIC Document No. ED 319 678.

This study was undertaken for the purpose of investigating the use of telecommunications for extension courses in teacher education programs. Specific inquiry focused on two areas: current use (Part I) and equipment/delivery (Part II). Part I focuses on cost per student, types of extension courses, effect of geographic location, and success rate. Part II focuses on interactiveness, multimedia equipment, need for classroom facilitators, special methods for electing instructors, recommended instructional methods, and common problems. The study population consisted of 11 institutions with reputations for successful extension programs delivered via telecommunications. Because of increased enrollment potential, institutions of higher education should find the results valuable. This paper includes the survey instrument, responses to each question, and an analysis of the findings.

Reiser, Robert A., and Walter Dick. "Evaluating Instructional Software." *Educational Technology Research and Development*, 38, No. 3 (1990), 43-50.

The author describes a new model for evaluating instructional software as well as a study in which the new model was field tested. Unlike most such models, which focus on the instructional and technical characteristics of software, the model focuses on the extent to which students learn the skills a software package is intended to teach. Reiser argues that by using this approach, educators will be better able to reliably identify software that is instructionlly effective.

Schweier, Richard. *Interactive Video*. (Englewood Cliffs, NJ: Educational Technology Publications, 1987). 204 p.

Schweier provides a step-by-step approach for instructional designers and video producers preparing to produce their first interactive videodisc. Chapters present the fundamentals of videotape and videodisc technology, a definition of interactive video, and sections on designing, producing, editing and the final steps necessary in getting the videodisc mastered, approved and replicated.

Stratil, M. "Artificial Intelligence in Higher Education and CBT Technology." *Education and Training Technology International*, 26 (August, 1989), 215-255.

Based on previous research, this article describes an attempt to combine a traditional computer-based training (CBT) approach with intelligent computer-assisted instruction (ICAI) to create training materials. Stratil describes the hardware and software of the Eurobench Workstation, its configuration and courseware generation.

Strittmatter, Peter. "European Research on Media and Technology in Education: Current Status and Future Directions." *International Journal of Educational Research*, 14 (1990), 489-505.

This article surveys a number of developments in media and mass communication research and presents results that are important for educational research in teaching and learning. In many European countries, disparate research areas have investigated questions which focus on learning from both mass media and "instructional" media use in schools and in the community. The emphasis is on current examples drawn primarily from the German context but which are believed to be typical of general European perspectives on media research which is oriented toward the new "cognitive" psychology of learning. After an overview that describes many directions and theories, the author presents a specific example of studies from the laboratory at the University of Saarbrucken.

Suhor, Charles. "Media and English: What Happened?" *Teaching English in the Two-Year College*, 13 (December, 1986), 254-260.

Suhor assesses the evolution of use of nonprint media in the classroom from the late 1960s to the present, with particular attention to six types of media-related articles produced during this period. He provides rationales for the use of media in English classes and includes an update concluding that an evolutionary rather than revolutionary change is taking place.

Thompson, Anthony Hugh. "University Libraries and Multimedia Development." *Audiovisual Librarian*, 15 (November, 1989), 203-205.

Universities in Great Britain still have predominantly print-based libraries unlike colleges and polytechnics which now provide a similar range of courses and most of which have multimedia libraries. While universities attribute this fact to their heavy commitment to research, a recent study of predominantly print-based university libraries points to a number of significant constraints on audio-visual development: no spare funds; little or no support from teaching staff and students; and lack of enthusiasm of library staff. However, there is encouraging evidence to suggest that some universities--Salford and Southampton-- are seriously considering more effective and economic organization and use of their resource services.

Ullmer, Eldon J. "High-Tech Instructional Development: It's the Thought That Counts." *Educational Technology Research and Development*, 37, No. 3 (1989), 95-101.

Predictions that technology will soon bring about a revolution in teaching are now common. Some see this occurring as an inevitable result of the information storage and processing capabilities that new technologies possess; others believe that changes in values and technology application strategies will be more significant factors. This article argues that technologies affect education greatly by shaping attitudes about the nature of teaching and learning, and presents a simple model to illustrate this process.

Waggoner, M. "The New Technologies Versus the Lecture Tradition in Higher Education. Is Change Possible?" *Educational Technology*, 24 (March, 1984), 7-13.

The emerging technologies potential has not altered teaching methods in higher education because of such factors as prohibitive cost and faculty resistance to change, but these are symptomatic of more pervasive organizational attributes and educational system dynamics, including student influences, faculty incentive structure, lack of leadership, and institutional environment.

Wetsel, M. C. "Process Video in Scientific Higher Education." *Journal of Educational Technology Systems*, 16 (1987), 265-282.

This paper examines variants of process video that emphasize three-way interactions among instructors, students and video machinery at universities. Guidelines show how simple video assistance was introduced and developed into more fully instrumented learning environments. The science of learning is seen to be helpful in integrating research by merging video and computer science.

Weyer, Stephen A. "As We May Learn," in *Interactive Multimedia: Visions of Multimedia for Developers, Educators, and Information Providers*, edited by Sueann Ambron and Kristina Hooper. (Redmond, WA: Microsoft Press, 1988), 88-103.

In an extension of Vannevar Bush's article "As We May Think." *Atlantic Monthly*, 176 (July, 1945), 101-108, Weyer describes a Memex system envisioned by Bush and now made possible with the advent of CD-ROM and writable optical storage, high-bandwidth networks, and hypertext-like software systems. The theme of his paper is that the system, instead of being only a passive tool or repository of information, should become a partner with the learner in searching, interpreting, and creating knowledge.

Winn, William D. "A Theoretical Framework for Research on Learning from Graphics." *International Journal of Educational Research*, 14 (1990), 553-564.

Recent advances in computer software have made it easy for people without skill in instructional design to create diagrams, charts, and graphs, and have led to the inclusion of these graphics in all manner of applications. The development of a theory of how people learn from graphics leading to a prescriptive theory for their design is therefore urgently required. Such a theory must consist of a thorough description of the symbol system of graphics and of an account of how the symbolic elements of graphics influence preattentive and attentive perceptual and cognitive processes that lead to their interpretation by students. This article sketches such a theory and illustrates it with research on visual perception and learning from graphics.

LIBRARY APPLICATIONS: ONLINE CATALOGS/CD-ROM INTERNET/HYPERTEXT/VIRTUAL REALITY/ETC.

Arms, Caroline R. "A New Information Infrastructure." *Online*, 14 (September, 1990), 15-22.

Arms provides background on networks and describes two national networks, the Internet and BITNET. Several related topics are also addressed: convergence of BITNET and the Internet; network decentralization; a proposed comprehensive national research and education network (NREN); libraries and the proposed network; and the library of the future. She includes a network resource guide.

Bailey, Charles W., Jr. "Intelligent Multimedia Computer System: Emerging Information Resources in the Network Environment." *Library Hi Tech*, 8 (1990), 29-41. [Issue 29]

A multimedia computer system is one that can create, import, integrate, store, retrieve, edit and delete two or more types of media materials in digital form, such as audio, image, full-motion video and text information. This paper surveys four possible types of multimedia computer systems: hypermedia, multimedia database, multimedia message, and virtual reality systems. The primary focus is on advanced multimedia systems development projects and theoretical efforts that suggest long-term trends in this increasingly important area. Bailey discusses the potential use of multimedia computer systems as public access systems in libraries including the fiscal, legal, organizational, standardization, and technological challenges that will have to be met.

Becker, Henry Jay. "Encyclopedias on CD-ROM: Two Orders of Magnitude More than Any Other Educational Software Has Ever Delivered Before." *Educational Technology*, 31 (February, 1991), 7-20.

There are presently three encyclopedias available on CD-ROM: (1) Grolier's *Electronic Encyclopedia*; (2) World Book's *Information Finder*; and (3) Compton's *Multimedia Encyclopedia*. Becker suggests ideas for how they might be used in the classroom, discusses information retrieval versus motivation, examines learning processes, and explains stand-alone versus networked products.

Bevilacqua, Ann F. *Hypertext: Behind the Hype*. [ERIC Digest] 1989. 4 p. ERIC Document No. ED 308 882.

This digest begins by defining the concept of hypertext and describing the two types of hypertext--static and dynamic. Three prototype applications are then discussed: (1) *Intermedia*, a large-scale multimedia system at Brown University; (2) the *Perseus Project* at Harvard University, which is developing interactive courseware on classical Greek civilization using *Hyper-Card*; and (3) Project Jefferson at the University of Southern California, which has developed applications using the Apple Macintosh hardware and HyperCard software. Bevilacqua considers some problems of hypertext systems, such as orientation to the database, cognitive overload, and compatibility.

Birchfield, Marilee. *Casting a New Net: Searching Library Catalogs Via the Internet*. [Paper presented at the Illinois Library Association/College and Research Libraries Forum Fall Conference, Urbana, IL, November 8-9, 1990. 6 p. ERIC Document No. ED 329 295.

Noting that telecommunications technology is making it possible to search library catalogs around the nation and the world via a modem and a personal computer, this paper highlights some of the reasons why a researcher would wish to search library catalogs through the Internet, which is a network of networks with connections to almost 1,000 regional, government, and campus networks. Birchfield also discusses some of the problems encountered by users of the Internet, efforts to improve existing documentation, outreach programs to increase awareness.

Brooks, Martin. "Multimedia and the Future of CD-ROM." *CD-ROM Professional*, 4 (September, 1991), 8-10.

Martin Brooks, Vice-President of Electronic Publishing at R. R. Bowker, presents his concerns regarding the hype surrounding multimedia. He fears that the hype generated might shift the interest from high-quality, extremely important research databases to any product that has sound and graphics in it. He poses the question: "For the researcher, should it not be more important to have a hypertext system that works intuitively than a database that plays back the mating calls of certain selected bullfrogs?" [Teri Rinne]

Buckland, Michael K. "Information Retrieval of More Than Text." *Journal of the American Society for Information Science*, 42 (September, 1991), 586-588.

Information retrieval has been primarily concerned with text and text-like data. Image-handling reminds us that information retrieval should have a broader scope, and it did in the neglected work of European pioneers such as Suzanne Briet [*Qu'est Que La Documentation?* (Paris: Editions Documentaires Industrielles et Techniques, 1951)] and Paul Otlet [*Traite de Documentation: Le Livre Sur Le Livre. Theorie et Practique*. (Brussels: Editiones Mundaneum, 1934)]. The terminology of "multimedia" needs attention to distinguish phenomena, facts, representations, forms of expression, and physical medium.

Carlson, Patricia Ann. "Square Books and Round Books: Cognitive Implications of Hypertext." *Academic Computing*, 4 (April, 1990), 16-19, 26-31.

The first wave of hypertext applications concentrated on the nodes and envisioned hypertext as an enhancement to online information delivery systems. The next generation of implementation, already in progress, focuses on the linkages and exploits the enormous diagnostic and tutoring potential of the web. Covering the history, the implications, and the applications of hypertext, Carlson explores the cognitive characteristics of a new category of mind-expanding, empowering software made possible by increased understanding of the potential of hypertext/hypermedia to foster thinking in education. She describes hypertext (and its extensions hypermedia) as "the round book" as opposed to the current notion of literacy based on "the square book."

Durlak, Jerome. "Mapping Our Way through the Information Jungle." *Journal of Dental Education*, 54 (September, 1990), 552-556.

Hypermedia for instructional purposes has the advantage that students may follow their own cognitive strategies and learn at their own pace, and the disadvantage that students may choose either a random or a logical path unless the author guides them. Overall, hypermedia offers a tool and process to facilitate learning not achievable with traditional methods.

Eckwright, Gail Z., and Mary K. Bolin. "No Card Cat--No Problem! WLN's LaserCat Provides Another Opportunity for Cooperation." *RQ*, 29 (Summer, 1990), 525-533.

This article discusses the implementation of WLN's LaserCat CD-ROM catalog in a medium-sized academic library. It describes the creation of a LaserCat/Information desk in the library lobby and the use of technical services librarians and paraprofessional staff from technical services and elsewhere in the library to staff the desk.

Elshami, Ahmed. *CD-ROM Technology for Information Managers.* (Chicago, IL: American Library Association, 1990). 280 p.

Optical storage technology is explained in this introduction for librarians and information specialists. Elshami explains the technology behind the different types of optical discs, their capabilities, and applications for library operations and data storage. Some of the important areas covered include how to automate the CD-ROM workstation to access different products, steps of producing a CD-ROM disc; CD-ROM hardware; and multi-access and local area networks (LANs). Appendices list more than 450 CD-ROM products, with descriptions of 50 which have library applications.

Fayen, Emily Gallup. *You've Come a Long Way, Baby, But...* 1986. 18 p. ERIC Document No. ED 282 518.

An online library system is an example of a complex computer system in that it supports a variety of users, both patrons and staff, and is made up of many intricate programs with complex relationships among them. The Northwestern Online Total Information System (NOTIS) exemplifies a user friendly system encompassing many of the desired features. Fayen describes these features, preliminary research findings about graphic design and layout, form and content of the screen displays, and discusses the need for further research to make the system more user friendly than it is.

Hardin, Steve. "Multiple Database Access: More Users, More Considerations." *CD-ROM Professional*, 4 (March, 1991), 32-34.

Hardin describes how the Educational Resources Information Center (ERIC) and several other databases were added to the online public access catalog at Indiana State University, and explores the impact of enhancing access in this manner at selected academic libraries. He also discusses telecommunications and software design as well as licensing agreements and relationships with database producers.

Hawkins, Donald T. "Technotrends: Imaging--Another New Technology for the Information World: The Basics." *Online*, 15 (November, 1991), 103-105.

Hawkins explores the basics of imaging. He estimates that over 90% of the information available to consumers is on paper, but with the availability of imaging technology in smaller and less expensive systems, the conversion of this information from printed to electronic form is becoming more feasible. He promises to examine retrieval from image-generated databases in future columns.

Heterick, Robert C., Jr. "Networked Information: What Can We Expect and When?" *CAUSE/EFFECT*, 13 (Summer, 1990), 9-14.

This article describes some of the potential inhibitors of the transformation of libraries by digital technologies and some steps that universities can take to overcome them. Included is information about the formation of a national coalition by the Association of Research Libraries, CAUSE, and EDUCOM--the Coalition for Networked Information.

Jorgensen, Corinne, and Peter Jorgensen. "Citations in Hypermedia: Maintaining Critical Links." *College & Research Libraries*, 52 (November, 1991), 528-536.

The lack of complete and accurate citations for referenced works is a persistent and significant problem in scholarly writing. The advent of new forms of electronic publishing, especially hypermedia, has the potential for either aggravating or alleviating this problem. Incorrect and missing citations will become more prevalent without a concerted and cooperative effort on the part of systems developers to provide adequate references and means for easily accessing and downloading them. This article examines some of the basic issues involved in the problem of maintaining the critical authorship links between source and expression in one specific form of electronic publishing--hypermedia--and proposes some solutions.

Kehoe, Brendan. *Zen and the Art of the Internet: A Beginner's Guide to the Internet*. (Chester, PA: 1991), 91 p.

This long-awaited guide to the Internet is hailed by those who have successfully retrieved and used it as the most comprehensive and user-friendly guide thus far produced. It is available as a computer file, in several formats, via ftp from *ftp.cs.widener.edu* in pub/zen as Zen-1 ... etc. Ongoing revisions will be indicated by revision number, *e.g.*: rev. 1.0 of February 2, 1992.

Kibirige, Harry M. "Information Communication Highways in the 1990s: An Analysis of Their Potential Impact on Library Automation." *Information Technology and Libraries*, 10 (September, 1991), 172-184.

This in-depth article explains how the combined increases in bandwidth of networks (primarily through the increased use of fiber optic cable and satellite transmission) and computing power of local systems are bringing immense changes in the library and information industry.

Knee, Michael, and Steven D. Atkinson. *Hypertext/Hypermedia: An Annotated Bibliography*. (Westport, CT: Greenwood Press, 1990). 224 p.

This is a comprehensive annotated bibliography on hypertext/hypermedia. The terms, used interchangeably, refer to an online system where users can access and interact with information in the form of text, graphics, music, video or animation. The bibliography includes the work of more than 350 authors and lists almost 500 citations. It includes books, book chapters, journal articles, conference proceedings, ERIC documents, government publications, and hypertext documents. Several earlier bibliographies on the subject are also included.

Locatis, Craig, Gary Letourneau, and Richard Banvard. "Hypermedia and Instruction." *Educational Technology Research and Development*, 37, No. 4 (1989), 65-77.

The authors contend that hypermedia has strengths and weaknesses and that it may become merely "hyped media" unless good teaching applications are developed. To prove their conclusion, they discuss hypermedia and its educational applications, supplying background information, and describe software, knowledge representation, navigation, and authoring issues. They also examine issues about hypermedia's role in learning and advance hypotheses about when it may be an effective teaching tool.

Lunin, Lois F., and Clifford A. Lynch, Editors. "Perspectives On...Imaging: Advanced Applications." *Journal of the American Society for Information Science*, 42 (September, 1991), 575-620.

The authors have pulled together a collection of articles on electronic imaging. Lynch begins the section with an overview of imaging technologies, as a primer for those unfamiliar with the technologies required to acquire, manipulate, store, and retrieve electronic images. Other articles offer a historical perspective, descriptions of particular imaging applications, and even some explorations of what may be the ultimate use of electronic imagery--virtual reality. [Roy Tennant]

Marchionini, Gary. "Hypermedia and Learning: Freedom and Chaos." *Educational Technology*, 28 (November, 1988), 8-12.

Defining hypertext as the electronic representation of text that takes advantage of the random access capabilities of computers to overcome the strictly sequential medium of print on paper, the author explains that "Hypermedia" extends the nonlinear representation and access to graphics, sound, animation, and other forms of information transfer. He traces the history of hypertext, describes the potentials of hypermedia and the hyperdocument, suggests future applications for educators, enumerates some problems, and concludes with the hope that the challenges to educational theory and practice presented by this new medium will be met.

Morariu, Janis. "Hypermedia in Instruction and Training: The Power and the Promise." *Educational Technology*, 28 (November, 1988), 17-20.

The author discusses the "power and the promise of hypermedia authoring tools in the design of instruction and training applications." She emphasizes that the careful instructional design and development by a team of professionals is just as critical in the design of instructional hypermedia environments as it is in the development of a textbook, film, or lecture.

"The Multimedia Centre for Education and Scientific Information Referral Centre of the University of Zagreb." *IRCIHE Bulletin*, 8 (1982), 7-8.

Since 1974 the multimedia centre has worked as a public service to enable pupils, students and teachers to become acquainted with computers, computer programming, computer assisted learning and to facilitate their independent approach to computer systems. The article outlines the main tasks of the multimedia centre; the equipment it has acquired; and use made of the facilities.

Rogers, Sharon J., and Charlene S. Hurt. "How Scholarly Communication Should Work in the 21st Century." *College & Research Libraries*, 51 (January, 1990), 5-8.

Scholarly journals are obsolete as the primary vehicle for scholarly communication. Rogers and Hurt urge that we harness available technologies to reform the entire system of scholarly communication, indicating that appropriate steps to do so will allow us to use the $500 million spent annually on journal subscriptions to finance a new system. They describe steps to be taken that will make the new system a reality. [This essay originally appeared in the October 18, 1989 issue of *The Chronicle of Higher Education*, the Point of View section, on page A56]

Roysdon, Christine M., and Laura Lee Elliott. "Electronic Integration of Library Services Through a Campuswide Network." *RQ*, 28 (Fall, 1988), 82-93.

In 1986, Lehigh University initiated a campuswide network, creating an integrated electronic workplace for users. Through the capabilities of this network, a broader range of library services is available to the university community. Network reference services include electronic question negotiation, online searching applications, and uploaded bibliographic files. The growth of this network demonstrates enhanced efficiency and communication between patrons and librarians.

Rumsey, Eric. "The Power of the New Microcomputers: Challenge and Opportunity." *College & Research Libraries*, 51 (March, 1990), 95-99.

In the next few years the power and usability of the microcomputer will increase immensely. Current developments that are contribuing to this growth are CD-ROM, the 80386 microprocessor, and the graphic user interface. As the information-handling capability of the computer grows with these new developments, the microcomputer industry will increasingly market information products to end users. As this happens, the library will be challenged to provide users the same ease of access to information that they have on their own computers.

Steffey, Ramona J. "The NOTIS Multiple Database Access System: A Look Behind the Scenes." *Online*, 14 (September, 1990), 46-49.

This article on the NOTIS interface to locally mounted database tapes looks at the experience of the Vanderbilt University Library. Topics covered include the system control file, master functions, database functions, terminal functions that regulate access, database maintenance, impact on the local computer system, and report features.

Ambron, Sueann, and Kristina Hooper. *Interactive Multimedia: Visions of Multimedia for Developers, Educators, & Information Providers*. (Redmond, WA: Microsoft Press, 1988). 339 p.

This collection of articles represents contributions presented at an invitational conference on Multimedia in Education held June 19 and 20, 1986. Participants, all of whom are multimedia specialists, represented many different traditional perspectives, including computer science, engineering, education, publishing, and television. The book is basically a collection of examples, lavishly illustrated to provide the reader with a better idea of what multimedia is and why it is likely to have a major impact on education as well as business. Multimedia programs covered include *The Voyage of the Mimi, NoteCards, Cicero, HyperCard, Grapevine*, and the *Shakespeare Project*. [Also available as cited below: "Multimedia in Education."]

Ambron, Sueann, and Kristina Hooper. *Learning with Interactive Multimedia: Developing and Using Multimedia Tools in Education*. (Redmond, WA: Microsoft Press, 1990). 383 p.

This collection of articles represents contributions presented at the second invitational conference held in Cupertino, California in October, 1988 on HyperCard and Education. Addressed to those interested in interactive multimedia and learning, these papers explore "innovations of the multimedia vanguard,...real world experiences in developing multimedia technology and integrating the technology into the curricular." The volume includes discussions of the first "Hyperschool," the Apple Classroom of Tomorrow project, analyzes new cross media art forms, provides thoughts on the "Hyperboom," and speculates on computers and education in the year 2000. Ambron's essay, "Multimedia Composition-- Is It Similar to Writing, Painting and Composing Music? Or Is It Something Else Altogether?" clarifies and defines the topic, and the many illustrations, charts, and graphs contained in the volume help the reader visualize the concepts presented.

Ambron, Sueann, and Kristina Hooper, Editors. "Multimedia in Education." [Proceedings of an Invitational Conference on Multimedia in Education (Cupertino, California, June 19-20, 1986] *Learning Tomorrow: Journal of the Apple Education Advisory Council*, 3 (Spring, 1987), 346 p. ERIC Document No. ED 302 179.

Published in book form as *Interactive Multimedia...* in 1988. See annotation under this title herewith.

Bajarin, Tim. "Everyone You Know Doesn't Use a Computer." *Computer Currents*, 9 (September 24, 1991), 16-19.

A short column about future computing with pen-based and multimedia technologies. The increasingly digital world can become more accessible to those who do not now own a computer through developments like these. [Mark Takaro]

Brandes, Ute, and Ulrike S. Rettig. "Language and Culture: A Third-Year Course in Advanced Conversation and Style." *Unterrichtspraxis*, 19 (Spring, 1986), 14-40.

A fifth-semester university course in German involves students in the analysis of the stylistic features of the language and its function in specific cultural contexts, such as films, speeches, songs, and newspapers. The course is conducted entirely in German and focuses on a single stylistic theme each week.

Brooks, David W. "Live Chemistry: Canned Lectures." *Journal of College Science Teaching*, 15 (November, 1985), 110-112.

The author describes how "live" experiments were combined with media packages and recorded lectures to allow coverage of more material and foster greater student/teacher interactions. Notes were distributed at the beginning of the semester to allow students to record experimental data from class demonstrations. A discussion of the problems and suggestions for course development conclude the article.

Campbell, Robert. "(I Learned It) Through the Grapevine: Hypermedia at Work in the Classroom." *American Libraries*, 20 (March, 1989), 204-205.

A project that was intended to aid students researching *The Grapes of Wrath* developed into a program that uses the Apple Macintosh computer with HyperCard and a videodisk to put users in touch with the sights, sounds, issues, and events of the United States in the 1930s.

Corcoran, Elizabeth. "Show and Tell." *Scientific American*, 261 (July, 1989), 72, 74.

The author discusses some classroom and industry applications for hypermedia including computers, videodisks, and monitors. She summarizes some of the criticism and the issues involving the applications of hypermedia.

Crane, Gregory, and Elli Mylonas. "The Perseus Project: An Interactive Curriculum on Classical Greek Civilization." *Educational Technology*, 28 (November, 1988), 25-31.

The Perseus Project, computer-based materials on Greek Civilization, is designed to support learners, instructors and researchers to explore this complex subject. The producers believe that the most effective learning comes through the process of active inquiry into a subject rather than passive acceptance and repetition of fixed sources of information. Disciplines ranging from classics and western civilization to political science, art, and philosophy will be able to incorporate Perseus into their curricula. The article describes the project's present status and discusses future plans.

D'Ignazio, Fred. "The Multimedia Classroom: Making It Work." (Part 2 of 2) *Classroom Computer Learning*, 10 (November-December, 1989), 36-39.

D'Ignazio discusses products and activities which can be used in a multimedia computer setting. He highlights the use of video cameras, video digitizers, and video overlays and provides examples of how this technology can be used by students.

D'Ignazio, Fred. "The Multimedia Sandbox: Creating a Publishing Center for Students." *Classroom Computer Learning*, 10 (October, 1989), 22-29.

In the first of his two-part article, the author describes inexpensive ways for students to become multimedia producers. He provides examples of items that may be found in the school or community (scavenged multimedia) that can be used to invent a high-tech publishing studio on a low tech budget. An insert describes eighteen examples of multimedia projects developed in schools in various parts of the country.

Friedlander, Larry . "Moving Images into the Classroom: Multimedia in Higher Education." *Laserdisk Professional*, 2 (July 1989), 33-38.

Describing a project at Stanford University, California, the author discusses the suitability of multimedia technology for the representation of complex visual events in the classroom and describes a program that uses videodisk and HyperCard to teach students about the factors involved in the creation of theatrical performances. He suggests principles to guide the design of multimedia applications for the classroom.

Friedlander, Larry. "The Shakespeare Project: Experiments in Multimedia." *Writing Notebook: Creative Word Processing in the Classroom*, 8 (April-May, 1991), 4-6.

The Shakespeare Project is a multimedia system on HyperCard with a two-screen workstation linking a Macintosh, videodisc player, and video monitor. This project brings theater to students as a serious object of study.

Friedlander, Larry. "The Shakespeare Project: Experiments in Multimedia Education." *Academic Computing*, 2 (May-June, 1988), 26-29, 66-68.

This is an earlier description of the interactive video system of animated programs developed at Stanford University than those cited above. The system enables drama students to design and stage their own versions of scenes and learn about the theatrical process quickly and inexpensively. The discussion covers the development of the programs and offers examples of their implementation.

Gibbon, Sam, and Kristina Hooper. "The Voyage of the *MIMI*." *Learning Tomorrow: Journal of the Apple Education Advisory Council*, No. 3 (Spring, 1987), 195-207. [Also Available as ERIC Document No. ED 302 188. 13 p.]

This paper, delivered at an Invitational Conference on Multimedia in Education held at Cupertino, CA, on June 19-20, 1986, describes the Voyage of the MIMI, a major educational project housed at Bank Street College, New York, directed toward the development of extensive television, computer software, videodisk, and print materials for use in science and mathematics education in grades 5-7. The first part includes a 13-part dramatic television series about a scientific investigation of whaling on the East Coast on a ship called the MIMI. Accompanying these TV materials are a teacher's guide, a book, and four computer programs (simulations of ecosystem development and population growth patterns, a navigation game, and computer-based tools for measurement experiments). The experimental project also included visits to different "real" scientific establishments. Evaluations indicated that the dramatic story served as an excellent motivator for students in the areas of mathematics and science.

Hansen, E. "The Role of Interactive Video Technology in Higher Education: Case Study and a Proposed Framework." *Educational Technology*, 30 (September, 1990), 13-21.

This discussion of interactive educational technology focuses on a case study using a hypertext-related concept of interactive video to teach interviewing skills to graduate students. Topics discussed include teaching professional interpersonal skills; intelligent computer-assisted instruction; learning processes; learner control; teacher roles; and collaborative learning activities.

Harward, V. Judson. "From Museum to Monitor: The Visual Exploration of the Ancient World." *Academic Computing*, 2 (May-June, 1988), 69-71.

The author discusses the problems encountered in viewing original works of art for scholarship purposes and argues that a combination of videodisks and computers offers a cost effective method of reproduction. He describes the development of the Perseus Project, a visual database of ancient Greece, focusing on the project's advantages to scholars.

Harward, V. Judson. "Perseus Project: Interactive Teaching and Research Tools for Ancient Greek Civilization." *Scope: Humanities Computing Update*, 5 (November December, 1987), 68.

The Perseus Project is an educational program utilizing computer technology to study ancient Greek civilization. Including approximately ten percent of all ancient literature and visual information on architecture, sculpture, ceramics, topography, and archaeology, the project spans a range of disciplines. Harward states that Perseus fuels student interest and promotes critical and creative thinking.

Kinnamon, J. C., and Sandra Oehring. "Software Workshop." *Instructor*, 100 (October, 1990), 52-54.

This is a review of computer programs covering several subject areas and grade levels. The programs include multimedia courseware, simulations, and interactive software. The authors offer teaching tips that suggest methods of utilizing these programs.

Koelewyn, Ariel C., and Katherine Corby. "Citation: A Library Instruction Computer Game." *RQ*, 22 (Winter, 1982), 171-174.

The popularity of arcade video games and the games available on the college computer led the authors to try a library instruction computer game. They created a computer-game based on the *Readers' Guide*. Citation challenges players' skill at using the *RG*, and by keeping track of the elapsed time needed to complete an assignment, encourages them to increase their skill. Taking a cue from the video-game arcades, the scores of the top ten players are stored and displayed to later players.

Manning, Jeanne L. "Using TV/Video as Primary Text in a Foreign Language Classroom at the University of Colorado, Denver." *Foreign Language Annals*, 21 (October, 1988), 455-461.

A fourth-semester French course uses "France-TV Magazine," a videotaped news program broadcast via satellite, as the major text. Grammar, reading materials, and regular compositions are integrated to supplement and reinforce the primary text--television.

Martorella, Peter H. "Harnessing New Technologies to the Social Studies Curriculum." *Social Education*, 55 (January, 1991), 55-57.

Martorella describes the effects of interactive video in the social studies classroom. He delineates the basic system components and how they may be used to access

multimedia kits or to create teacher-designed systems. He illustrates the method by using kits in a tenth grade world history class and an eighth grade unit on the 1988 presidential campaign.

May, Charles. *The American Short Story: From Poe to O.Henry. A Hypercard Application*. 1990. 38 p. ERIC Document No. ED 330 315.

This report describes a computer-assisted instructional application created on a Macintosh computer using HyperCard software. The instructional program is aimed at those who teach college-level English education courses and those who are planning a course on the use of technology in the English classroom. It is noted that the HyperCard software was developed to aid in teaching English literature, and provides access not only to the text of the short story, but also to concepts and patterns throughout the story. The report includes discussion of the rationale behind using the Macintosh computer, the concept of hypermedia and hypertext and, in particular, the use of HyperCard on the Macintosh. The author also describes the theory of short story analysis that underlies the computer application, and concludes the report with a detailed discussion of programming using HyperCard software. He suggests a method for creating unique applications to meet the needs of individual classrooms.

Miller, Susan W., and Richard A. Jackson. "A Comparison of a Multi-Media Instructional Module with a Traditional Lecture Format for Geriatric Pharmacy Training." *American Journal of Pharmaceutical Education*, 49 (Summer, 1985), 173-176.

The authors compare the effectiveness of a multimedia instructional module and traditional lecture format, using the pretest-posttest control group experiment design. They found the two to be equally effective in teaching content in geriatric pharmacy.

Norkeliunas, Casimir J. "Transition from Multimedia Materials to Interactive Videotape in Teaching Russian Culture and Language." *CALICO Journal*, 2 (December, 1984), 19-22.

A course is taught at Marist College, Poughkeepsie, New York, in which multimedia and computer-assisted instruction are used to teach Russian culture. The writer explains that the use of this approach helps to meet individual needs in large classes.

Reissman, Rose. "In Media Res: Sifting Through the Sands of Critical Thinking and Multimedia." *Writing Notebook: Creative Word Processing in the Classroom*, 8 (April-May, 1991), 8-9.

This article includes a program description and a classroom teaching guide. It describes how elementary and secondary students use computers to create "prequels"

to videos shown in their English classes. The author discusses how the activity promotes critical thinking, predictive viewing, reading, and writing skills.

Tengwall, David. *Teaching History with Media: A Case Study*. (Arnold, MD: Anne Arundel Community College, 1980). 22 p. ERIC Document No. 196 471.

Although research has demonstrated that the well-planned use of audio-visual media enhances student learning, classroom use of media is usually confined to sporadic, individual presentations which serve only as an auxiliary to the lecture and which are too often regarded by the student as entertainment. To realize the potential of AV media and to combat the distraction encountered when they are used only periodically, instructors should design Learning Media Systems in which media modules are consistently used in tandem with conventional methods. This integration of media in the learning process, in addition to being cost effective, can help convey thoughts that are too cumbersome for words and can foster student interest and commitment to study.

Westerfield, Kay. "Improved Linguistic Fluency with Case Studies and a Video Method." *English for Specific Purposes*, 8 (1989), 75-83.

This is a description of an English for specific purposes case study course designed to improve both oral and written skills of students about to seek the master of business administration degree. A video method helps to develop fluency in small-group discussion, a skill that is important for other classroom activities.

Wood, Allen G. "Phedre, Queen of Hearts, in the Classroom." *Foreign Language Annals*, 20 (February, 1987), 51-55.

A visual method of classroom presentation was needed to represent the structure and movement of drama and to move from written text to performance dynamics. A photographic slide was made showing character presence in each scene, and the sequence of slides for the entire play was presented for explanation and discussion.

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MULTIMEDIA TERMINOLOGY

COLLECTION DEVLOPMENT INTEREST GROUP
CONSORTIUM OF COLLEGE AND UNIVERSITY MEDIA CENTERS
SPRING 1991

ASCII - AMERICAN STANDARD CODE FOR INFORMATIONAL INTERCHANGE

An internationally accepted standard code which allows computers to exchange data and information.

AUTHORING SYSTEM

A high level formatted application development tool that defines the options for instructional design and presentation. An authoriing system is the foundation of a multimedia program. It facilitates the integration of computer-based data, with video and audio from the videodisc player. These systems are usually either Macintosh or IBM compatible. A few (i.e., AUTHORWARE) have dual compatibility.

CAV - CONSTANT ANGULAR VELOCITY

The "standard play" laser videodisc format where the disc rotates at a constant number of revolutions/unit of time. Each 12" disc will hold 54,000 video frames (30 minutes of data/side) which can be called up and displayed individually with most videodisc players. Allows two audio tracks to be played either individually or simultaneously with video. This format is most commonly used for interactive applications.

CLV - CONSTANT LINEAR VELOCITY

The laser videodisc format generally used for linear applications (concerts, music videos, movies) in which a disc rotates at a variable number of revolutions of time. This format allows for recording up to 60 minutes of motion video on each side of a 12" disc. Frame search and retrieval is limited to pre encoded stops and does not allow for the call up and display of individually frames by the user.

CD-ROM - COMPACT DISK-READ ONLY MEMORY

A 4.75" optical disc used for permanent data storage in computer systems. The small discs store large amounts of data and are increasingly used for searching dictionaries, encyclopedias and databases.

CGA, EGA, VGA, SUPER-VGA - COLOR GRAPHICS ADAPTER, ENHANCED GRAPHIC ADAPTER, VIDEO GRAPHICS ARRAY, SUPERVIDEO GRAPHICS ARRAY

Each provides a different level of screen resolution. A CGA monitor offers the lowest level of resolution for text and graphics while an EGA provides mid-level screen resolution. VGA and Super-VGA offer higher resolution. VGA provides a 640 x 480 screen resolution, while the industry standard for Super-VGA varies between anything higher than the VGA standard and resolution of 800 x 600.

GUI - GRAPHICAL USER INTERFACE

A means of employing an icon or image-based menu of symbols rather than using text commands.

ICON

A picture or symbol used to represent a task, program, file or device in a graphic-based environment (i.e., the Macintosh in a DOS Windows computer).

INTERACTIVE VIDEO LEVEL I

Level I utilizes a laser videodisc player which is controlled by an infrared key pad (remote) or bar code scanner and a monitor. User interaction includes frame and chapter search and retrieval, scanning forward and backward and audio manipulation.

INTERACTIVE VIDEO LEVEL II

Level II utilizes a videodisc player that has a programmable memory. A computer program is encoded on channel two of the videodisc and loaded into the player's memory. In other cases the program is entered with a keypad. Interaction is controlled by the program in the player's memory.

INTERACTIVE VIDEO LEVEL III

Level III integrates a videodisc player, a computer, and authoring software to create and control highly branched random access software. The videodisc player is controlled by the computer allowing more individualized interaction and learning.

MOUSE

A hand-held device (peripheral) that rolls on a data pad and enables the user to enter (and alter) graphical information into the system.

MULTIMEDIA

The integration of level III Interactive video with various image and sound technologies (i.e., audio- and video digitizers, microscopes, cameras). Allows for sophisticated non-linear software development and display, pacing for individual student needs, immediate student feedback. Engages the "entire" student, perceptually as well as cogently. Places control of technology and course information in the hands of the instructor, thereby supporting a personalized teaching style.

OPTICAL DISKS

A plastic disk on which data are recorded by means of bits encoded on (or just under) its surface. These bits usually take the form of microscopic pits that are burned into the surface of the original/master disk by a laser beam. Videodiscs, CD-ROMs, and compact discs are all examples of optical disks. They come in various sizes: 12", 8", 4,75" and 3.2". The advantage of these disks is their tremendous storage capacity.

PERIPHERALS

An ancillary device that is used with a computer to control and manipulate data. Examples include: printers, modem, mouse, digitizers, videodisc player, video microscope, bar code and graphic scanners, video camera, video projector.

SCANNER

An input device (peripheral) that converts an image on paper into an electronic representation that can be stored in the computer's memory.

Prepared by Lisa Livingston

AUTHORING SYSTEMS

COLLECTION DEVELOPMENT INTEREST GROUP
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SPRING 1991

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HyperWriter (Apple)

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